The Faculty Academy for the Scholarship of Education (FASE) is delighted to present a series of lunchtime seminars with the aim of disseminating good practice in education across the Faculty.

Tuesday 8 May 2012
1:00pm – 2:30pm
Oceans Institute Seminar Room G.05

Power Systems and Systems of Power: Connecting Energy and Justice in Engineering Thermodynamics

Energy is a basic human need; technologies for energy conversion and use are fundamental to human survival. As energy technology evolves to meet future demands for development and ecological sustainability, engineers need to have up-to-date skills and knowledge to meet the creative challenges our energy problems demand. At the heart of these challenges lie fundamental questions of justice, calling engineers to develop a deeper understanding of the relationship between technology and society and a broader sense of ethics.

Presently, most thermodynamics education adheres narrowly to an unspoken canon, grounded in 19th century developments of the steam engine in Europe, and subsequent fossil fuel technologies. Some texts have added updates, sidebars and problems on more recent technologies, including renewable energy, but they have not been reframed around the broader educational outcomes engineers need to attain to create the changes needed for a sustainable and just energy future.

A series of learning modules have been designed and packaged as a textbook companion, connecting traditional textbooks with these broader skill and knowledge sets, leveraging critical pedagogies that foster intentional learning through hands-on and/or independent student explorations. Some explicitly take up questions of justice: What are the responsibilities of Northern and Southern nations in addressing climate change? How does U.S. food policy create relationships between energy density and energy cost of food that link poverty, hunger, and obesity? How can thermodynamics expand its canon to include voices long silenced? Who benefits from and who bears the costs of the harm done by our quest for energy resources, including armed conflict and environmental devastation?

These modules develop moral reasoning, critical thinking, social engagement, communication, and organizing skills that are essential complements to an energy engineer’s technical expertise. A dissemination grant from the US National Science Foundation has created the opportunity to understand how and under what circumstances mainstream thermodynamics professors might adapt and implement this kind of material into their classes. I will share preliminary findings from this research.

About the speaker
A/Prof Donna Riley - Donna Riley is a founding faculty member in the Picker Engineering Program at Smith College, the United States’ first accredited engineering program for women. Riley received her Ph.D. in engineering and public policy from Carnegie Mellon University and her B.S.E. in chemical engineering from Princeton University.

Riley’s technical research has considered indoor air quality and chemical consumer product risks; she is presently collaborating with a chemist at Smith to develop a community-based air quality lab. In 2005 Riley received a CAREER award from the National Science Foundation for implementing feminist and critical pedagogies in engineering education. She has developed these classroom innovations into a book of educational modules (Engineering Thermodynamics and 21st Century Energy Problems: A Textbook Companion for Student Engagement, Morgan and Claypool, 2011).

Riley is active in the Engineering, Social Justice and Peace network (esjp.org); as part of that work, she published her first book, Engineering and Social Justice (Morgan and Claypool, 2008), and co-edited the contributed volume Engineering and Social Justice: In the University and Beyond (Purdue University Press, 2012).

Notes for participants
Numbers are limited, so please register your attendance to Erin Rummer (Email: erin.rummer@uwa.edu.au) by 4 May 2012.
Light lunch and refreshments will be provided.
Registration confirms your attendance at the seminars.
Please provide a minimum of two days notice for cancellation.